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PATENT SPECIFICATION

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S75368

S960196

APPLICATION No.

IMPROVED HAND ACCESS PORT

The present invention relates to an improved hand access port which enables hand access during laproscopic surgery while retaining pneumoperitioneum. This invention is an improvement over the invention described in detail in WO-A-9522289, published on August 24 1995, the contents of which are incorporated herein by reference.

The invention will now be more particularly described with reference to the accompanying drawings, which show, by way of example only, one embodiment of a hand access port according to the invention.

In the drawings:

Figure 1 is a perspective view of the hand access port;

Figure 2 is a cross-sectional view of the hand access port in position on a patient's body;

Figure 3 is a front elevation of the hand access port showing an end view of an insulflation valve and a pair of arcuate bands which act to provide a taut valve;

Figures 4a, 4b and 4c are a perspective view, side view and end view respectively of the insulflation valve used in the device; and

Figures 5a, 5b, 5c, 5d and 5e respectively are a plan view of one of the bands before application to the device, an end view, a front view, an exploded detailed view and side view showing the engaging means of the bands.

Referring to the drawings, the hand access port according to the invention is indicated generally by reference numeral 10 and comprises a sleeve 12, having a proximal end 13 and a distal end 14. A flange 15 is located towards the distal end and is used to secure the device to a patient's body. Above the flange 15 is an inflatable chamber 16 having an entry opening 17 through which a surgeon's hand can enter. The operation of the device is described in detail in above mentioned International Publication No. WO-A-9522289.

In this invention, an insulflation valve 20 is provided on the outer sleeve of the chamber 16 so that the chamber can be inflated prior to the insertion of the surgeon's hand into the device. The gas pressure in the chamber 16 is maintained from gas flowing from the body cavity of the patient during pneumoperitioneum. After the initial inflation of the chamber 16 through the insulflation valve 20, the valve is closed and the pressure of the chamber is maintained as described. Details of the valve 20 are shown in Figures 4a, 4b and 4c. A knob 21 is provided for opening and closing the valve as desired and is held in position by a ring nut 22, screwed onto a shaft 23 engaged in a hole in the outer sleeve of the chamber 16.

Beneath the flange 15 is the tensioning device 30 which comprises a pair of identical arcuate bands 32 which are engaged together through two orifices at each side of the edges of the inner sleeve 11 which protrudes into the patient's body in Figure 2. The two bands 32 apply a lateral pull to the sleeve 11 bringing the opposing faces of the sleeve into mutual contact and form an initial seal without the action of insuflation pressure. The geometry of the bands 32 is such that when presented at right angles to the incision made in the patient's body, it is

possible for them to pass through the incision. Once in position within the abdomen, the bands 32 align themselves normally parallel to the abdominal wall. In this way, the device is anchored in position and the bands provide the final seal by means of a taut valve through which a surgeon's hand must pass when entering the patient's body. The other seals are formed after insuflation of the device.

As shown in Figure 5a, each band is formed with a bend 40 formed in the middle with two male studs 42 at one end and two orifices 43 at the other end. The tensioning device 30 is formed by reversing two bands 42 so that the male studs 42 engage in the orifice 43 of the other band. When they are fully engaged, the band effectively flips over so as to become a generally concave construction formed from two convex bands. The resilience in the material and the shape of the bands causes the tension which provides the taut valve effect in the device. The material used in the particular embodiment is PETG.

As shown in Figure 5d, the region of the band carrying the studs 32 has an elongate ridge 45 which seats in groove 46 of the part carrying the orifices 43. This provides a further location means and assistance in locking two bands together. The studs 42 engage in the orifices 46 through holes provided in the sleeve 11.

It will of course be understood that the invention is not limited to the specific details described herein, which are given by way of example only, and that various modifications and alterations are possible within the scope of the invention.

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CLAIMS:

1. An access port device for use in surgery comprising a sleeve having an entry opening located at a proximal end of the sleeve, an exit opening located at a distal end thereof for insertion into an incision made in a patient's body, the exit opening allowing access to the patient's body cavity and exit opening sealing means provided by the sleeve being collapsible by gas pressure within the abdominal cavity of the patient at or adjacent the distal edges of the sleeve, whereby when the patient's body cavity is inflated by gas, the exit sealing means prevents substantial leakage of gas from the patient's body cavity while providing access for a surgeon's hand or surgical instrument and entry sealing means comprising an inflatable chamber provided on the proximal end of the sleeve for sealing the device in the region of the entry opening, so that when the patient's body cavity is inflated by gas, the entry sealing means assists in preventing substantial leakage of gas from the patient's body cavity while providing access for a surgeon's hand and sealing about the arm remaining outside the access port device,

characterised in that an insufflation valve is provided on an outer surface of the inflatable chamber to allow the chamber to be inflated prior to the insertion of the surgeon's hand into the device.

2. An access port as claimed in Claim 1 in which the sleeve comprises sheets of flexible, gas impermeable, sterilisable, biocompatible material which are collapsible by gas pressure within the abdominal cavity of the patient at or adjacent, the distal edges of the sleeve and in which a separate tensioning device is provided in the

distal region of the sleeve spaced from the distal edge to place the sheets under a generally transverse tension thereby creating a taut region across the sleeve operable as a further seal as part of the exit sealing means, the tensioning device comprising a pair of opposed arcuate bands operable to prevent retraction of the sleeve and in which wings are provided at the side edges of the sleeve to provide anchoring points for the opposed arcuate bands, each band having a bend intermediate a pair of male studs on one wing and two orifices on the other wing, the studs of one band being engageable in the orifices of the other band to form the tensioning device.

3. An access port as claimed in Claim 2, in which the region of the band having the studs has a ridge engageable with a corresponding groove provided in the region of the band having orifices, thereby providing further means for locating and locking the two bands together.

4. An access port as claimed in any one of the preceding claims, wherein the sleeve is provided with a flange having adhesive thereon for affixing the access port externally to the patient.

5. An access port as claimed in any one of the preceding claims, substantially as herein described with reference to and as shown in the accompanying drawings.

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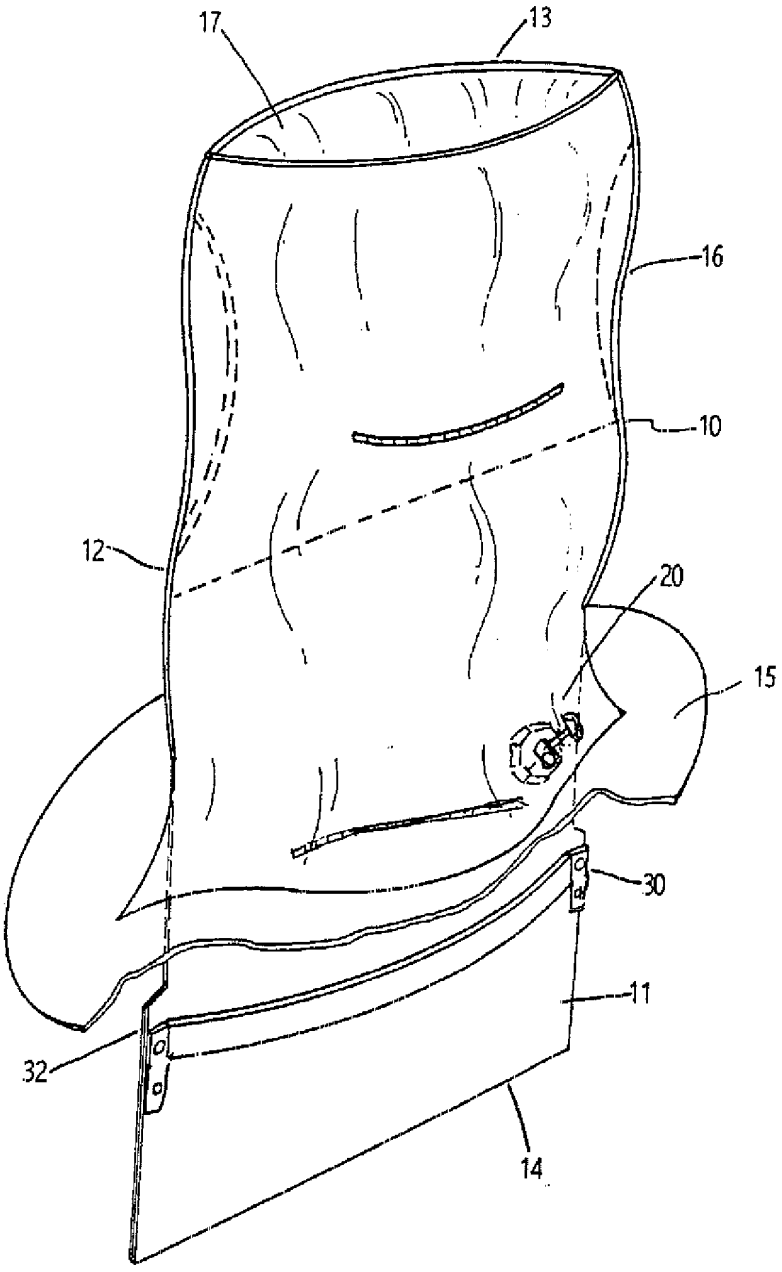

FIGURE 1

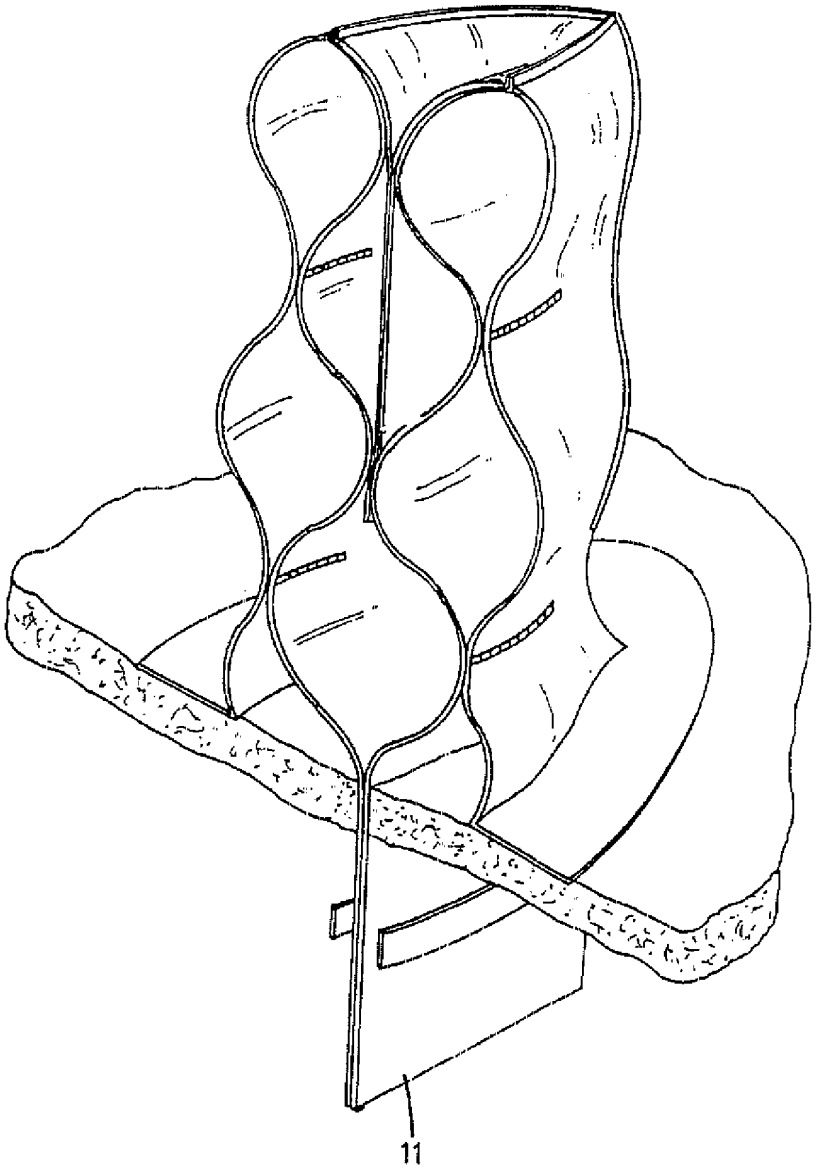

FIGURE 2

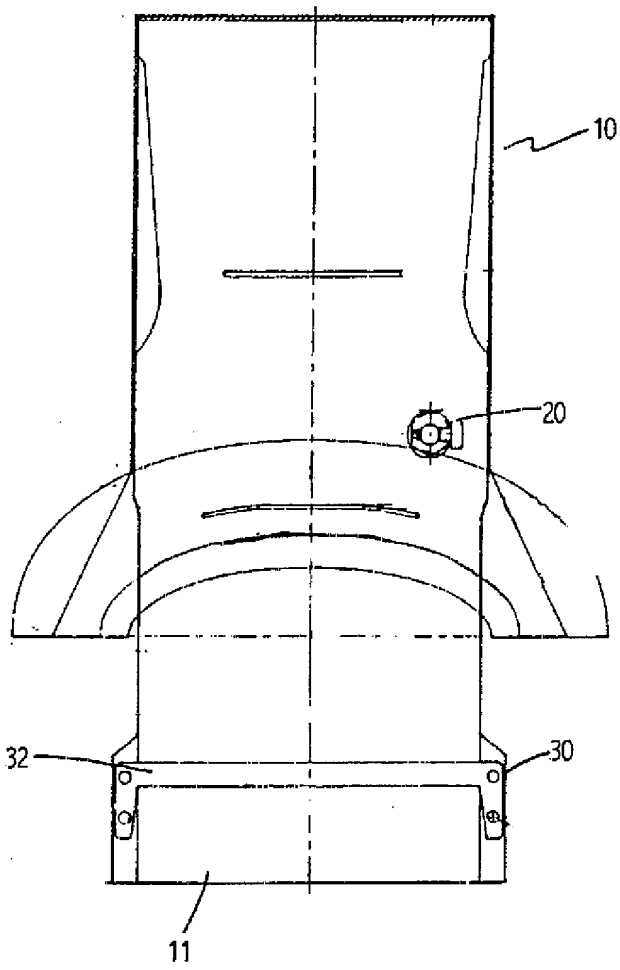

FIGURE 3

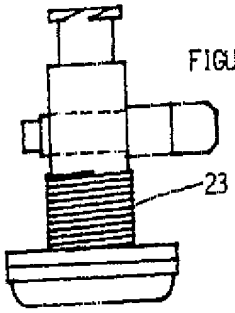

FIGURE 4b

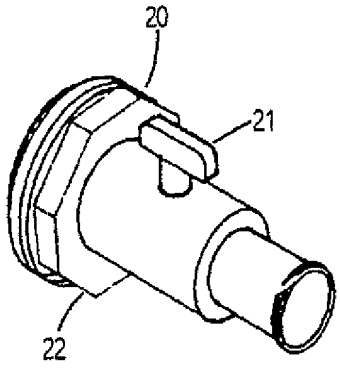

FIGURE 4a

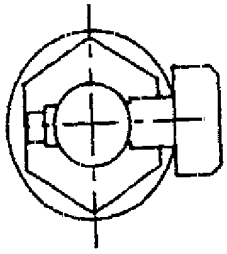

FIGURE 4c

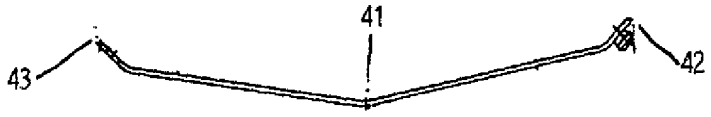

FIGURE 5a

FIGURE 5b

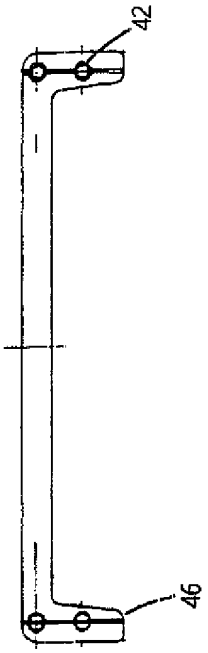

FIGURE 5c

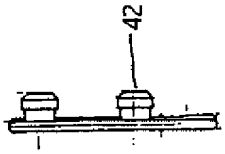

FIGURE 5e

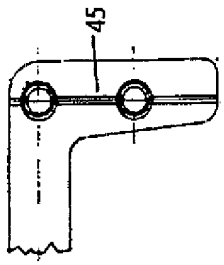

FIGURE 5d